

REMARKS

As a result of the amendment, claim 1 has been canceled in this application. Claims 27 and 33 have been amended to further indicate that the zero-valent metal particles are contained within an emulsion micelle. Support for these amendments is found on page 8, lines 4-5 and page 9, lines 11-14 of the present application. The Examiner has indicated that this limitation in the claims was not found and that the claims should be allowable. Additionally, the specification and claims 27 and 31 were amended to include a water-in-oil emulsion. As indicated on page 5, lines 18-21, the emulsion is "hydrophobic, which allows the DNAPL source, for example TCE, to enter through an oil membrane where it can diffuse to the zero-valent metal particle and undergo degradation". This indicates that the emulsion must be a water-in-oil emulsion. The recitation of an oil-in-water emulsion on page 8, line 4 was inadvertent and should read as being a "water-in-oil emulsion" as amended herein. Furthermore, "an aqueous slurry of reactive iron particles would be rejected by the hydrophobic DNAPL pool".

As requested by the Examiner, the Specification has been amended to include a priority reference to U.S. Patent 6,664,298 dated 12/16/2003.

Claim 1 stands rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,664,298. The Applicants have hereby canceled claim 1. Therefore, no terminal disclaimer is needed in this application and the rejection is hereby overcome.

Claim 1 is objected to because it includes the language “zero-valent metal emulsion”. Since Applicants have canceled claim 1, this objection is hereby overcome.

Claims 1 and 27-38 stand rejected under 35 U.S.C. 102(f) because “the applicant did not invent the claimed subject matter”. Applicants respectfully traverse the stated ground of rejection. Applicants, Debra Reinhart, Christian Clausen, Cherie Geiger, Kathleen Brooks and Jacqueline Quinn listed in the Declaration are the sole and true inventors of the invention described and claimed in U.S. patent application Serial Number 10/701,412. Dr. David Major, as an employee of support contractor GeoSyntec, performed certain, non-inventive tasks under NASA contract NAS 10-01026 including injecting emulsion into test wells. Dr. Major also supervised the engineering plans for implanting the technology as well as obtaining permits required by the state of Florida prior to injecting a “solution” into a drinking water aquifer. A pair of Declarations is submitted with this response. One of the Declarations has been prepared and executed by Dr. Jacqueline Quinn, lead NASA inventor. Dr. Quinn sets forth the duties of Dr. Major and specifically states that Dr. Major was not an inventor of the presently claimed invention. The second Declaration was prepared and executed by Dr. David Major, in which he affirmatively states that he did not contribute in any way to the final concept of the invention as disclosed and claimed. For the reasons stated hereabove as supported by the enclosed Declarations, it is respectfully asserted that the named inventors are the sole and true inventors of the invention. For that reason, it is requested that the rejection under 35 U.S.C. 102(f) be withdrawn and that a notice of allowability be issued for the remaining claims.

Claims 1 and 27-28, 30, 33-34, and 36 stand rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al U.S. Patent 5,990,365. Claims 27 and 33 have been amended to clearly state that the zero-valent metal particles are part of the emulsion. The zero-valent metal particles are contained within the emulsion micelle. Conversely, the Change reference is directed to the use of an emulsion to treat a metal-containing catalyst system. Although the Chang reference discloses an emulsion, it does not disclose the addition of zero-valent metal particles emulsified with the surfactant, oil and water. Applicant's reactive system uses an emulsion including metal particles as part of a reactive redox system and these particles are consumed in a dehalogenation reaction. Claims 28, 30, 34 and 36 are dependent from claims 27 and 33 and would be subject to the same limitation added to independent claims 27 and 33. For the foregoing reasons, Applicants assert that the prior art rejection is overcome and request favorable reconsideration.

Claims 1 and 27-28 and 33-34 stand rejected under 35 U.S.C. 102(b) as being anticipated by "Abstract: In-Situ Reductive Dehalogenation of DNAPLs by the Use of Emulsified Zero-Valent Nanoscale Iron Particles", 1999 NASA STTR Phase 1 Proposal # 990094, as found during a using www.google.com, at the website http://www.spacepda.net/abstracts/99/sttr_html/02-990094.htm. Hereafter, this document will be called "DNAPLs Proposal # 990094. "A reference must enable someone to practice the invention in order to anticipate under §102(b)". Symbol Technologies, Inc. v. Opticon, Inc. , 935 F.2d 1569, 19 USPQ2d 1241 (1991).

Applicants assert that the DNAPLs Proposal #990094 was a Research Proposal and does not adequately disclose how to make and use the present invention. Therefore, Applicant asserts that

this reference should be withdrawn as prior art. It is requested that the rejection under 35 U.S.C. 102(b) be withdrawn and that a notice of allowability be issued for the remaining claims.

Claims 1 and 27-28 and 33-34 stand rejected under 35 U.S.C. 102(a) as being anticipated by "In-Situ Treatment of DNAPL with Zero-Valent Iron Emulsions", presented 12 June 2001, hereinafter called – The DNAPLS Paper--. The Examiner asserts that the DNAPLS Paper is considered by another inventive entity due to the presence of Dave Major as an author. A pair of Declarations is submitted with the response. One of the Declarations has been prepared and executed by Dr. Jacqueline Quinn, lead NASA inventor and author of The DNAPLS Paper. Dr. Quinn sets forth the duties of Dr. Major and specifically states that Dr. Major was not an inventor of the material disclosed in The DNAPLS Paper. As stated previous, Dr. David Major, as an employee of support contractor GeoSyntec, performed certain, non-inventive tasks under NASA contract NAS 10-01026 including injecting emulsion into test wells. Dr. Major also supervised the engineering plans for implanting the technology as well as obtaining permits required by the state of Florida prior to injecting a "solution" into a drinking water aquifer. The second Declaration was prepared and executed by Dr. David Major, in which he affirmatively states that he did not contribute in any way to the final concept of the invention disclosed in The DNAPLS Paper. For the reasons stated hereabove as supported by the enclosed Declarations, it is respectfully asserted that Dr. Major is not an inventor of The DNAPLS Paper and that this reference should be withdrawn as prior art. It is requested that the rejection under 35 U.S.C. 102(a) be withdrawn and that the claims are now in condition for allowance.

Claims 29-30 and 35-36 are rejected under 35 U.S.C. 103(a) as obvious over DNAPLS Proposal # 990094 in view of Matyjaszewski et al. U.S. Patent 6,121,371. "In order to render a claimed apparatus or method obvious the prior art must enable one skilled in the art to make and use the apparatus and method." Beckman Instruments, Inc. v. LKB Produkter AB, 892 F.2d 1547, 13 USPQ2s 1301 (Fed. Cir. 1989). As stated previously, the DNAPLS Proposal # 990094 is a brief abstract of a Proposed Research Project and does not disclose how to make or use the invention. The Matyjaszewski reference is only being applied to teach the use of various surfactants. The Examiner has asserts that it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the DNAPLS Proposal # 990094 to include the surfactants taught in Matyjaszewski. However, even if one were able to modify the DNAPLS Proposal #990094 to include the surfactants taught in Matyjaszewski, the combined references would still not enable one of ordinary skill in the art to make and use the invention. Additionally, the Matyjaszewski reference discloses "the preparation of well-defined polymeric materials...by radical polymerization in an emulsion or suspension system", see column 2, lines 53-56. Conversely, the present invention and the DNAPLS Proposal #990094 are directed to the use of an emulsion to dehalogenate solvents found in water. In order to combine prior art references, there must be a suggestion or motivation in the references to do so. Neither the Matyjaszewski reference nor the DNAPLS Proposal #990094 provides any motivation that the references should be combined. One of ordinary skill in the art would not be motivated to combine the teaching of the DNAPLS Proposal # 990094, which is directed to an emulsion used in a dehalogenation process, with the teaching of Matyjaszewski, which discloses an emulsion used in a polymerization process. Therefore, Applicants submit that the rejection has been overcome and that the claims are now in condition for allowance.

Claims 29-30 and 35-36 are rejected under 35 U.S.C. 103(a) as obvious over the DNAPLS Paper in view of Matyjaszewski et al. U.S. Patent 6,121,371. As stated previously, the DNAPLS Paper should be withdrawn as a reference since the inventors of the presently claimed invention and the inventors of the subject matter of the DNAPLS Paper are the same. Although Dr. Major is listed as an author, the attached Declarations show that he is not an inventor of the material disclosed in the DNAPLS Paper. The Matyjaszewski reference discloses "the preparation of well-defined polymeric materials...by radical polymerization in an emulsion or suspension system", see column 2, lines 53-56. The Matyjaszewski reference does not disclose nor suggest the use of zero-valent metal particles in an emulsion. Therefore, Applicants assert that the rejection is overcome and submits that the claims are in condition for allowance.

Claims 31-32 and 37-38 stand rejected under 35 U.S.C. 103(a) as obvious over the DNAPLS Paper in view of Borden et al. U.S. Patent 6,398,960. As stated previously, the DNAPLS Paper should be withdrawn as a reference since the inventors of the claimed invention and the inventors of the subject matter of the DNAPLS Paper are the same. Although Dr. Major is listed as an author, the attached Declarations show that he is not an inventor of the material disclosed in the DNAPLS Paper. The Borden reference discloses a method for remediating aquifers and groundwater contaminated by toxic material using a microemulsion. However, the Borden reference does not disclose nor suggest the use of zero-valent metal particles within the emulsion. Therefore, Applicant asserts that the rejection is overcome and submits that the claims are in condition for allowance.

Claims 31-32 and 37-38 stand rejected under 35 U.S.C. 103(a) as obvious over the DNAPLS Proposal # 990094 in view of Borden et al. U.S. Patent 6,398,960. First, “in order to render a claimed apparatus or method obvious the prior art must enable one skilled in the art to make and use the apparatus and method.” Beckman Instruments, Inc. v. LKB Produkter AB, 892 F.2d 1547, 13 USPQ2s 1301 (Fed. Cir. 1989). The DNAPLS Proposal # 990094 is a brief abstract of a Proposed Research Project and does not disclose how to make or use the invention. The Borden reference is being applied to teach the use of various oils. Therefore, the Borden reference is being used to support a non-enabled reference. Second, although the Borden reference discloses a method for remediating aquifers and groundwater contaminated by toxic material using a microemulsion, the microemulsion degrades the contaminate in a significantly different manner than the presently claimed invention. In Borden, the introduction of a “soluble oil provides both carbon substrate and electron donor to stimulate the growth of natural and/or introduced populations of microorganisms”, (see column 6, lines 15-17). “This metabolism results in creation of anaerobic subsurface conditions that promote the activity of secondary indigenous or amended populations of anaerobic dehalogenating bacteria”, see column 6, lines 18-21 of the Borden reference. Additionally, “the organisms degrade the toxic organic compounds contained in the groundwater”, see column 6, lines 22-23 of the Borden reference. Conversely, the presently claimed invention provides that the contaminate material diffuses through the oil membrane of the present emulsion whereupon they reach the surface of the zero-valent metal particles where dehalogenation takes place, see page 9, lines 11-14. The zero-valent metal assists in the reductive dehalogenation of chlorinated solvents, see page 9, lines 1-5. Likewise, the DNAPLS Proposal #990094 is directed to a dehalogenation process using zero-valent iron particles. In order to combine prior art references, there must be a suggestion or

motivation in the references to do so. Neither the DNAPLS Proposal #990094 reference nor the Borden reference provides any motivation that the references should be combined. One of ordinary skill in the art would not be motivated to combine the teaching of the Borden reference, which relies on the use of a soluble oil in an emulsion to stimulate the growth of natural and/or introduced populations of microorganisms, with the DNAPLS Proposal #990094, which provides an emulsion with zero-valent metal particles for direct dehalogenation of a contaminated source. Therefore, Applicants submit that the rejection has been overcome and that the claims are now in condition for allowance.

In view of the foregoing, Applicants respectfully submit that the art rejections are overcome by the amendments to claims 27 and 33, which provide that the zero-valent metal particles are contained within an emulsion micelle, and that the application is now in condition for allowance. Accordingly, favorable reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

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